Prediction of Pediatric Percutaneous Nephrolithotomy
Outcomes Using Contemporary Scoring Systems

Purpose: We evaluate the applicability of contemporary percutaneous nephrolithotomy scoring systems in pediatric patients and compare their predictive power regarding postoperative outcomes.

Materials and Methods: We retrospectively analyzed the records of 125 children who were diagnosed with renal calculi and underwent percutaneous nephrolithotomy between March 2011 and April 2016. Predictive scores, which consisted of Guy's Stone Score, S.T.O.N.E. (stone size, tract length, obstruction, number of involved calyces and essence/stone density) nephrolithometry and CROES (Clinical Research Office of the Endourological Society) nomogram, were calculated for all patients included in the study. Patient demographics, stone free rate and complications were all analyzed and are reported.

Results: Median Guy's Stone Score was 2 (IQR 2 to 3) in patients with residual stones (group 1) and 2 (1 to 2) in those who were stone-free (group 2). Median respective CROES nomogram scores were 215 (IQR 210 to 235) and 257 (240 to 264), and S.T.O.N.E. nephrolithometry scores were 8 (7 to 9) and 5 (5 to 6, all $p < 0.0001$). S.T.O.N.E. score demonstrated the greatest accuracy in predicting stone-free rate. Guy's Stone Score was significantly correlated with complications but the CROES and S.T.O.N.E. scores were not significantly correlated with complications.

Conclusions: The scoring systems analyzed could be used to predict success of percutaneous nephrolithotomy in the pediatric setting. However, further studies are needed to formulate modifications for use in children. The main variables in the scoring systems, ie stone burden, tract length and case volume, were measured using records from adult patients. Besides these variables, the relatively small pelvicalyceal system and higher incidence of anatomical malformations in children could potentially affect percutaneous nephrolithotomy outcomes.